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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/651,328

08/28/2003

Amy H. Kang

5681-69401

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58467

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11/12/2008

MHKKG/SUN

P.O. BOX 398

AUSTIN, TX 78767

EXAMINER

WANG, RONGFA PHILIP

ART UNIT

PAPER NUMBER

2191

MAIL DATE

DELIVERY MODE

11/12/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/651,328	<b>Applicant(s)</b> KANG ET AL.	
	<b>Examiner</b> PHILIP WANG	<b>Art Unit</b> 2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,4-12,31-39,42-44,46-51,54-56 and 58-62 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-12,31-39,42-44,46-51,54-56 and 58-62 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is in response to communication filed on 8/14/2008.
2. Claims 1, 4-12, 31-39, 42-44, 46-51, 54-56, and 58-62 remain pending.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 4-12, 31-39, 42-44, 46-51, 54-56, and 58-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over "The Error Handling Interface (H5E)" (herein H5E-A) in view of Srivastava et al. (USPGN 2005/0160431)" (herein Srivastava).

As per claim 1,

H5E-A discloses

- A processor; and a memory comprising program instructions, wherein the program instructions are executable by the processor to implement (H5E-A, p. 1, Introduction, "...within the HDF5 library...application-called API function..."; "Example: An Error Message", see

Art Unit: 2191

error message "HDF5-DIAG: Error detected in thread 0, this shows support for the single threaded program.):

- in each thread of a threaded program, for each error generated by one or more functions executed in the thread, store an error trace element in a memory storage area in accordance with an application programming interface (API) to the error trace mechanism (p. 1, below example, "The error stack can also be manipulated by these functions..." Since there is only one thread in this case, errors recorded are specific to the thread); and
- obtain an error trace for the thread of the threaded program in accordance with the API to the error trace mechanism (H5E-A, p. 1, 2. Error Handling Operations, 2<sup>nd</sup> para., "The error stack can also be printed..."; p. 3, see herr\_t H5Ewalk());
- wherein an error trace includes one or more error trace elements specific to the corresponding thread, wherein each error trace element includes information describing a particular error generated during execution of the corresponding thread (H5E-A, p. 1, Example: An Error Message, where it shows multiple trace elements, "#000: H5T.c line 462" ).

H5E-A does not specifically disclose

- two or more threads of a multithreaded program and storing an error trace element in a memory area private to the thread for each of the two or more threads .

However, Srivastava discloses

Art Unit: 2191

- two or more threads of a multithreaded program and storing an error trace element in a memory area private to the thread for each of the two or more threads ([0003], "...Each distributed node may also maintain multiple trace logs corresponding to separate threads...")

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Srivastava into the teachings of H5E-A to include the limitation disclosed by Srivastava. The modification would be obvious to one of ordinary skill in the art to want to be able to debug related events that span across a plurality of threads as suggested by Srivastava(see abstract).

As per claim 4,

the rejection claim 1 is incorporated;

H5E-A discloses

- each error trace further includes a field indicating a count of the error trace elements in the error trace (p. 3, under herr\_t H5Ewalk "The error stack..."; and under typedef herr\_t, "...n is sequence number...").

As per claim 5,

the rejection claim 1 is incorporated;

H5E-A discloses

Art Unit: 2191

- wherein each error trace element indicates one or more of a location where the particular error of the error trace element occurred, an error type of the particular error, and what the particular error is (p. 1, Example: An Error Message, where line number is a location and major or minor types are shown.).

As per claim 6,

the rejection claim 5 is incorporated;

H5E-A discloses

- wherein the location of the particular error includes one or more of a function name, a source file name, and a line number where the particular error occurred (p. 1, Example: An Error Message, where H5T.c is the function name).

As per claim 7,

the rejection claim 1 is incorporated;

H5E-A discloses

- wherein the program is further configured to determine from each error trace element one or more of a location where the particular error of the error trace element occurred, an error type of the particular error, and what the particular error is (p. 1, Example: An Error Message).

As per claim 8,

the rejection claim 1 is incorporated;

Art Unit: 2191

H5E-A discloses

- wherein the error trace mechanism is a C/C++ interface library (p. 1,

Example: An Error Message, see H5T.c).

As per claim 9,

H5E-A discloses

- a processor; and
- a memory comprising program instructions, wherein the program instructions are executable by the processor to implement a library and a threaded program configured to call library functions of the library in accordance with an application programming interface(API) to the library; wherein the library function is configured to, for each thread of the threaded program, add an error trace element to an error trace for each error generated on the thread by the library functions to an error trace in a memory storage area to the thread, wherein each error trace element includes information describing a particular error generated during execution of the library function(H5E-A, p. 1, Introduction, "...within the HDF5 library...application-called API function..."; "Example: An Error Message", see error message "HDF5-DIAG: Error detected in thread 0, this shows support for the threaded program; p. 1, below example, "The error stack can also be manipulated by these functions..." Since there is only one thread in this case, errors recorded are specific to the thread);

Art Unit: 2191

- and wherein, after completion of the library function, the threaded program is configured to obtain an error trace for a thread corresponding to the call of the library function in accordance with the API to the library (H5E-A, p. 1, Example: An Error Message, where it shows multiple trace elements, "#000: H5T.c line 462"; p. 3, see `herr_t_H5Ewalk()` is an API to the library to obtain error trace. ).

H5E-A does not specifically disclose

- two or more threads of a multithreaded program and storing an error trace element in a memory area private to the thread for each of the two or more threads .

However, Srivastava discloses

- two or more threads of a multithreaded program and storing an error trace element in a memory area private to the thread for each of the two or more threads ([0003], "...Each distributed node may also maintain multiple trace logs corresponding to separate threads...")

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Srivastava into the teachings of H5E-A to include the limitation disclosed by Srivastava. The modification would be obvious to one of ordinary skill in the art to want to be able to debug related events that span across a plurality of threads as suggested by Srivastava(see abstract).



Art Unit: 2191

As per claim 10,

the rejection claim 9 is incorporated;

H5E-A discloses

- the called library function is configured to call one or more other library functions in a function call stack, wherein each of the one or more other library functions is configured to, if the library function generates an error, add an error trace element to an error trace in a memory storage area to a thread corresponding to the function call stack (see 1. Introduction).

H5E-A does not specifically disclose

- a memory area private to the thread for each of the two or more threads .

However, Srivastava discloses

- a memory area private to the thread for each of the two or more threads ([0003], "...Each distributed node may also maintain multiple trace logs corresponding to separate threads...")

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Srivastava into the teachings of H5E-A to include the limitation disclosed by Srivastava. The modification would be obvious to one of ordinary skill in the art to want to be able to debug related events that span across a plurality of threads as suggested by Srivastava (see abstract).

Art Unit: 2191

As per claims 11-12,

the rejection of claim 9 is incorporated and further

- claims 11-12 recite the same limitation of claims 7 and 8 respectively and are rejected for the same reason set forth in the rejection of claims 7 and 8 respectively.

As per claim 31,

H5E-A discloses

- a processor; and a memory comprising program instructions, wherein the program instructions are executable by the processor to implement a library comprising one or more library functions and an application programming interface (API) to the library, wherein the API includes: one or more function definitions configured for access of the one or more library functions by a threaded program; and a function definition for a get error trace function configured for access by the threaded program to get error traces generated by the one or more library functions in two or more threads of the multithreaded program, wherein each error trace is stored in a memory storage area to the thread (see page 1, sections 1 and 2, for API functions for a thread program; also see page 3, for example `herr_t H5Ewalk() );`
- wherein each error trace includes one or more error trace elements specific to the thread, wherein each error trace element includes information describing a particular error generated during execution of the corresponding thread (page

Art Unit: 2191

1, paragraph 7, "Each thread has its own error stack...multi-threading...").

H5E-A does not specifically disclose

- a multithreaded program and storing an error trace element in a memory area private to the corresponding thread for each of the two or more threads .
- threads .

However, Srivastava discloses

- two or more threads of a multithreaded program and storing an error trace element in a memory area private to the thread for each of the two or more threads ([0003], "...Each distributed node may also maintain multiple trace logs corresponding to separate threads...")

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Srivastava into the teachings of H5E-A to include the limitation disclosed by Srivastava. The modification would be obvious to one of ordinary skill in the art to want to be able to debug related events that span across a plurality of threads as suggested by Srivastava(see abstract).

As per claim 32,

the rejection of claim 31 is incorporated and further

- Refer to rejection of claim 10.

Art Unit: 2191

As per claim 33,

the rejection of claim 32 is incorporated and further

- Refer to rejection of claim 6.

As per claim 34,

the rejection of claim 31 is incorporated and further

- Refer to rejection of claim 7.

As per claim 35,

the rejection of claim 31 is incorporated and further

- Refer to rejection of claim 8.

As per claim 36,

H5E-A discloses a system, comprising:

- means for a plurality of functions in a function call stack to generate information describing one or more errors generated by the plurality of functions (See 1. Introduction);
- means to obtain the generated information (H5E-A, p. 1, 2. Error Handling Operations, 2<sup>nd</sup> para., "The error stack can also be printed..."; p. 3, see herr\_t H5Ewalk());
- and means to determine from the obtained information one or more of a location where each error occurred, an error type of each error, and what

Art Unit: 2191

the each error is (H5E-A, p. 1, Example: An Error Message, where it shows multiple trace elements, "#000: H5T.c line 462" ).

H5E-A does not specifically disclose

- two or more threads of a multithreaded program and storing an error trace element in a memory area private to the thread for each of the two or more threads .
- threads .

However, Srivastava discloses

- two or more threads of a multithreaded program and storing an error trace element in a memory area private to the thread for each of the two or more threads ([0003], "...Each distributed node may also maintain multiple trace logs corresponding to separate threads...")

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Srivastava into the teachings of H5E-A to include the limitation disclosed by Srivastava. The modification would be obvious to one of ordinary skill in the art to want to be able to debug related events that span across a plurality of threads as suggested by Srivastava(see abstract).

As per claim 37,

Art Unit: 2191

the rejection claim 36 is incorporated;

H5E-A discloses

- wherein the plurality of functions are functions of a library, further comprising means to call the plurality of functions in the function call stack from a program (p. 1. Introduction).

As per claim 38,

the rejection claim 37 is incorporated;

H5E-A discloses

- wherein the library is a C/C++ interface library (p. 1, Example: An Error Message).

As per claim 39,

H5E-A discloses

- Calling one or more functions in a thread of a threaded program; in each thread of the threaded program, for each error generated by the one or more functions called in the thread, storing an error trace element in a memory storage area private to the thread in accordance with an application programming interface (API) to an error trace mechanism; and the program obtaining an error trace for a thread of the threaded program in accordance with the API to the error trace mechanism; wherein each error trace includes one or more error trace elements specific to the corresponding thread, wherein each error trace element includes

Art Unit: 2191

information describing a particular error generated during execution of the corresponding thread(p. 1, below example, "The error stack can also be manipulated by these functions..." Since there is only one thread in this case, errors recorded are specific to the thread; H5E-A, p. 1, 2. Error Handling Operations, 2<sup>nd</sup> para., "The error stack can also be printed..."; p. 3, see herr\_t H5Ewalk());H5E-A, p. 1, Example:An Error Message, where it shows multiple trace elements, "#000: H5T.c line 462");

H5E-A does not specifically disclose

- a multithread program and for each of two or more thread of the threaded program, adding an error trace element for each error generated on the thread to an error trace in a memory storage area private to the thread.

However, Srivastava discloses

- a multithread program and for each of two or more thread of the threaded program, adding an error trace element for each error generated on the thread to an error trace in a memory storage area private to the thread.
- ([0003], "...Each distributed node may also maintain multiple trace logs corresponding to separate threads..." here the threaded program is a multithreaded program)

Art Unit: 2191

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Srivastava into the teachings of H5E-A to include the limitation disclosed by Srivastava. The modification would be obvious to one of ordinary skill in the art to want to be able to debug related events that span across a plurality of threads as suggested by Srivastava(see abstract).

As per claim 42,

the rejection claim 39 is incorporated;

H5E-A discloses

- wherein each error trace element indicates one or more of a location where the particular error of the error trace element occurred, an error type of the particular error, and what the particular error is (p. 1, Example: An Error Message).

As per claim 43,

the rejection claim 42 is incorporated;

H5E-A discloses

- wherein the location of the particular error includes one or more of a function name, a source file name, and a line number where the particular error occurred (p. 1, Example: An Error Message).



Art Unit: 2191

As per claim 44,

the rejection claim 39 is incorporated;

H5E-A discloses

- further comprising determining from each error trace element one or more of a location where the particular error of the error trace element occurred, an error type of the particular error, and what the particular error is (p. 1, Example: An Error Message).

As per claim 46,

the rejection claim 39 is incorporated;

H5E-A discloses

- wherein the error trace mechanism is a C/C++ interface library (p. 1, Example: An Error Message).

As per claim 47,

H5E-A discloses

- A threaded program calling library functions of a library in accordance with an application programming interface (API) to the library a thread program and for one thread of the threaded program, adding an error trace element for each error generated on the thread by the library functions to an error trace in a memory storage area private to the thread (p. 1, below example, "The

Art Unit: 2191

error stack can also be manipulated by these functions..." Since there is only one thread in this case, errors recorded are specific to the thread);

- after completion of a called library function, the threaded program obtaining an error trace for a thread corresponding to the call of the library function in accordance with the API to the library (H5E-A, p. 1, 2. Error Handling Operations, 2<sup>nd</sup> para., "The error stack can also be printed..."; p. 3, see herr\_t H5Ewalk());
- a threaded program and each error trace element includes information describing a particular error generated during execution of the corresponding thread (H5E-A, p. 1, Example: An Error Message, where it shows multiple trace elements, "#000: H5T.c line 462")

H5E-A does not specifically disclose

- a multithread program and for each of two or more thread of the threaded program, adding an error trace element for each error generated on the thread by the library functions to an error trace in a memory storage area private to the thread.

However, Srivastava discloses

- a multithread program and for each of two or more thread of the threaded program, adding an error trace element for each error generated on the thread to an error trace in a memory storage area private to the

Art Unit: 2191

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thread ([0003], "...Each distributed node may also maintain  
multiple trace logs corresponding to separate  
threads..." here the threaded program is a multithreaded  
program)
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Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Srivastava into the teachings of H5E-A to include the limitation disclosed by Srivastava. The modification would be obvious to one of ordinary skill in the art to want to be able to debug related events that span across a plurality of threads as suggested by Srivastava(see abstract).

As per claims 48-50,

the rejection of claim 47 is incorporated and further

- claims 48-50 recite the same limitation of claims 10, 7, and 8 respectively and are rejected for the same reason set forth in the rejection of claims 10, 7 and 8 respectively.

As per claim 51,

- it is the computer-accessible medium claim corresponding to method claim 39 and is rejected for the same reason set forth in connection of the rejection of claim 39 above.

Art Unit: 2191

As per claim 54,

the rejection claim 51 is incorporated;

H5E-A discloses

- wherein each error trace element indicates one or more of a location where the particular error of the error trace element occurred, an error type of the particular error, and what the particular error is (p. 1, Example, An Error Message) .

As per claim 55,

the rejection claim 54 is incorporated;

H5E-A discloses

- wherein the location of the particular error includes one or more of a function name, a source file name, and a line number where the particular error occurred (p. 1, Example, An Error Message) .

As per claim 56,

the rejection claim 51 is incorporated;

H5E-A discloses

- wherein the program instructions are further computer-executable to implement determining from each error trace element one or more of a location where the particular error of the error trace element occurred, an error type of the particular

Art Unit: 2191

error, and what the particular error is (p. 1, Example, An Error Message) .

As per claim 58,

the rejection claim 51 is incorporated;

H5E-A discloses

- the library is a C/C++ interface library (p. 1, Example, An Error Message) .

As per claim 59,

- it is the computer-accessible medium claim corresponding to method claim 47 and is rejected for the same reason set forth in connection of the rejection of claim 47 above.

As per claims 60-62,

- they are the computer-accessible medium claims corresponding to method claims 48-50 respectively and are rejected for the same reason set forth in connection of the rejection of claims 48-50 above respectively.

### **Response to Arguments**

Art Unit: 2191

2. Applicant's arguments with respect to claims 1, 4-12, 31-39, 42-44, 46-51, 54-56, and 58-62 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Wang whose telephone number is 571-272-5934. The examiner can normally be reached on Mon - Fri 8:00 - 4:00PM. Any inquiry of general nature or relating to the status of this application should be directed to the TC2100 Group receptionist: 571-272-2100.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached on 571-272-3708. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Philip R. Wang/ 10/27/2008

